Claims

What is claimed is:

1. a method and apparatus for interframe wavelet video coding, comprising:

an encoder for inputting a video frame, comprising a Motion Compensated Temporal Filtering (MCTF) analyzer, a spatial analyzer connected to said MCTF analyzer, a Discrete Wavelet Transform (DWT) coefficient encoder connected to said spatial analyzer, a packetizer connected to said DWT coefficient encoder, a motion estimator connected to said MCTF analyzer, and a Motion Information (MI) encoder connected to said packetizer and said motion estimator;

a decoder for outputting a video frame, comprising a de-packetizer, a DWT coefficient decoder connected to said de-packetizer, a spatial synthesizer connected to said DWT coefficient decoder, an MCTF synthesizer connected to said spatial synthesizer, and an MI decoder connected to said de-packetizer and said MCTF synthesizer; and

a puller connected to said encoder and said decoder,

wherein said method and apparatus is to partition an MI for scalability and to transfer a partition of said MI to a terminal to achieve said scalability.

2. The method and apparatus for interframe wavelet video coding according to claim 1,

wherein said MCTF analyzer is to analyze said video frame on temporal axis and decompose said video frame into high-pass frames of high frequency and low-pass frames of low frequency by using a motion vector obtained from said motion estimator so that

an output of temporal high-pass frames and temporal low-pass frames is obtained by an input of said video frame.

3. The method and apparatus for interframe wavelet video coding according to claim 1,

wherein said spatial analyzer is to decompose temporal high-pass frames and temporal low-pass frames into spatial

high-pass frames and spatial low-pass frames through Discrete Wavelet Transform (DWT) method so that

an output of said spatial high-pass frames and said spatial low-pass frames is obtained through DWT method by an input of said temporal high-pass frames and said temporal low-pass frames.

4. The method and apparatus for interframe wavelet video coding according to claim 1,

wherein said DWT coefficient encoder is to encode said video frame in a compression way on spatial high-pass frames and spatial low-pass frames that are obtained by said spatial analyzer so that

an output of a compressed video content bitstream is obtained by an input of said spatial high-pass frames and said spatial low-pass frames that are obtained through DWT method.

5. The method and apparatus for interframe wavelet video coding according to claim 1,

wherein said packetizer is to bundle a compressed video

content bitstream and a compressed MI into a single compound compressed bitstream so that

an output of said single compound compressed bitstream is obtained by an input of said compressed video content bitstream and said compressed MI.

6. The method and apparatus for interframe wavelet video coding according to claim 1,

wherein said motion estimator is to search for the motion vector of each said partition and continuously search through all said partitions and a compression is obtained by recording as a motion vector the corresponding block address of the minimal difference according to the relationship between two or more selected frames so that

an output of an MI is obtained by an input of said two or more selected frames.

7. The method and apparatus for interframe wavelet video coding according to claim 1,

wherein said MI encoder is to split all motion vectors of all

said partitions into a base layer and one or more enhancement layers and to apply entropy coding on said base layer and said enhancement layers to compress said MI applied with entropy coding so that

an output of a compressed MI is obtained by an input of said MI.

8. The method and apparatus for interframe wavelet video coding according to claim 1,

wherein said MI encoder is to do partitioned coding to said MI according to three precisions of spatial precision, temporal precision, or numerical precision.

9. The method and apparatus for interframe wavelet video coding according to claim 8,

wherein said spatial precision is a partitioned motion block.

10. The method and apparatus for interframe wavelet video coding according to claim 8,

wherein said temporal precision is a number of frames per second.

11. The method and apparatus for interframe wavelet video coding according to claim 8,

wherein said numerical precision is a precision of the arithmetic expression of a motion vector.

12. The method and apparatus for interframe wavelet video coding according to claim 1,

wherein said MI decoder is to help rebuild related information of said motion estimator.

13. The method and apparatus for interframe wavelet video coding according to claim 1,

wherein said DWT coefficient decoder is to apply compressed decoding on spatial high-pass frames and spatial low-pass frames that are obtained by said spatial analyzer so that

an output of said spatial high-pass frames and said spatial low-pass frames is obtained by an input of a compressed video content bitstream.

14. The method and apparatus for interframe wavelet video coding according to claim 1,

wherein said spatial synthesizer is to rebuild temporal high-pass frames and temporal low-pass frames from spatial high-pass frames and spatial low-pass frames through Inverse Discrete Wavelet Transform (IDWT) method so that an output of said temporal high-pass frames and said temporal low-pass frames is obtained through IDWT method by an input of said spatial high-pass frames and said spatial low-pass frames.

15. The method and apparatus for interframe wavelet video coding according to claim 1,

wherein said MCTF synthesizer is to synthesize temporal high-pass frames and temporal low-pass frames into a video frame by using motion vectors so that an output of a video frame is obtained by an input of said temporal high-pass frames and said temporal low-pass frames obtained through IDWT method.

16. The method and apparatus for interframe wavelet video coding according to claim 1,

wherein said MI decoder is to apply entropy decoding on said compressed MI and combine a base layer and one or more enhancement layers to form a motion vector so that

an output of an MI is obtained by an input of a compressed MI applied with entropy decoding.

17. The method and apparatus for interframe wavelet video coding according to claim 1,

wherein said puller is to read bit-rate/frame-rate/image-size information to partition a compressed video content bitstream; to decide whether one or more enhancement layers are needed on said bit-rate/frame-rate/image-size; to send the MI of a base layer; and to combine said partitioned compressed video content bitstream and a partitioned MI obtained by partitioning the MI of said enhancement layers according to said bit-rate/frame-rate/image-size, to form a compressed bitstream.

18. A method and apparatus for interframe wavelet video coding, comprising a plurality of steps of:

applying partitioned encoding on an MI encoder according to three precisions of spatial precision, temporal precision, and numerical precision; and

transferring data corresponding to said MI to achieve scalability of said MI by tuning said three precisions.

19. The method and apparatus for interframe wavelet video coding according to claim 18,

wherein said spatial precision is a partitioned motion block.

20. The method and apparatus for interframe wavelet video coding according to claim 18,

wherein said temporal precision is a number of frames per second.

21. The method and apparatus for interframe wavelet video coding according to claim 18,

wherein said numerical precision is a precision of the arithmetic expression of a motion vector.

22. The method and apparatus for interframe wavelet video coding according to claim 18,

wherein said scalability is a capability of accepting demands according to one factor or a plurality of factors among bit-rate/frame-rate/image-size and said three precisions.

23. The method and apparatus for interframe wavelet video coding according to claim 18,

wherein said MI is a motion vector and related data that helps to rebuild said motion vector.

24. The method and apparatus for interframe wavelet video coding according to claim 18,

wherein said video compressing method is an Interframe Wavelet Video Coding method.

25. The method and apparatus for interframe wavelet video

coding according to claim 18,

wherein said video compressing method is a video encoding method with motion information.